

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 C.F.R. § 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jarrett L. Silver (Reg. No. 60,239) on December 17, 2008.

The application has been amended as follows:

Amendments to the Claims:

Claim 4. An image processing apparatus for performing an image quality improving processing of an image, comprising:

a domain block extracting section for extracting a domain block image from an original image in the unit of a first block unit;

a range block extracting section for extracting a range block image from the original image in the unit of a second block unit which is larger than the first block unit with respect to the domain block image;

a reduced range block forming section for reducing the extracted range block image to the size of the first block unit;

an improved domain block forming section for performing a pixel value conversion with respect to the reduced range block image formed by the reduced range block forming section, and for outputting the pixel-value-converted reduced range block image as an improved domain block image;

a similarity degree judging section for judging a similarity degree between the domain block image and the reduced range block image by the reduced range block forming section, the improved domain block forming section performs the pixel value conversion based upon the similarity degree obtained by the similarity degree judging section; and

a domain block classifying section for classifying a sort of the domain block image extracted by the domain block extracting section,

wherein the domain block image other than the domain block image which has been classified to a previously determined sort is directly outputted as the improved domain block image, and

the domain block classifying section classifies the domain block image to a flat portion, a step edge portion, a noise portion, and a texture portion based upon both standard deviation and a concave/convex degree of the domain block image., and
the each of the above sections is implemented in hardware or hardware/software combination.

Claim 12. An image processing apparatus for performing an image quality improving processing of an image, comprising:

a domain block extracting section for extracting a domain block image from an original image in the unit of a first block unit;

a range block extracting section for extracting a range block image from the original image in the unit of a second block unit which is larger than the first block unit with respect to the domain block image;

a reduced range block forming section for reducing the extracted range block image to the size of the first block unit;

an improved domain block forming section for performing a pixel value conversion with respect to the reduced range block image formed by the reduced range block forming section, and for outputting the pixel-value-converted reduced range block image as an improved domain block image;

a similarity degree judging section for judging a similarity degree between the domain block image and the reduced range block image by the reduced range block forming section, the improved domain block forming section performs the pixel value conversion based upon the similarity degree obtained by the similarity degree judging section; and

an edge emphasizing section for executing an edge enhancement processing with respect to the improved domain block image based upon both a relationship between a maximum value and a minimum value of the pixel values within the improved domain block images, and an edge degree of the improved domain block image.
wherein each of the above sections is implemented in hardware or hardware/software combination.

Claim 20. An image processing method for performing an image quality improving processing of an image, comprising:

using a computer to perform the steps comprising:

extracting a domain block image from an original image in the unit of a first block unit;

extracting a range block image from the original image in the unit of a second block unit larger than the first block unit with respect to the domain block image;

reducing a size of the extracted range block image to the size of the first block unit;

judging a similarity degree between the reduced range block image and the domain block image;

forming an improved domain block image based upon a result obtained by converting pixel values as to the reduced range block image based upon the similarity degree-;

classifying a sort of the domain block image extracted from the original image; and

outputting the domain block image other than the domain block image which has been classified to a previously-determined sort as the improved domain block image, wherein the classifying of a sort of the domain block image classifies the domain block image to a flat portion, a step edge portion, a noise portion, and a texture portion based upon both standard deviation and a concave/convex degree of the domain block image.

Claim 28. An image processing method for performing an image quality improving processing of an image, comprising:

using a computer to perform the steps comprising:

extracting a domain block image from an original image in the unit of a first block unit;

extracting a range block image from the original image in the unit of a second block unit larger than the first block unit with respect to the domain block image;

reducing a size of the extracted range block image to the size of the first block unit;

judging a similarity degree between the reduced range block image and the domain block image;

forming an improved domain block image based upon a result obtained by converting pixel values as to the reduced range block image based upon the similarity degree; and

performing an edge enhancement processing with respect to the improved domain block image based upon both a relationship between a maximum value and a minimum value of the pixel values within the improved domain block images, and an edge degree of the improved domain block image.

REASONS FOR ALLOWANCE

2. The following is an examiner's statement of reasons for allowance: The closest prior art of record failed to teach or suggest the domain block classifying section classifies the domain block image to a flat portion, a step edge portion, a noise portion, and a texture portion based upon both a standard deviation and a concave/convex degree of the domain block and an edge emphasizing section for executing an edge enhancement processing with respect to the improved domain block image based upon both a relationship between a maximum value and a minimum value of the pixel values within the improved domain block images, and an edge degree of the improved domain block image.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSE M. TORRES whose telephone number is (571)270-1356. The examiner can normally be reached on M-F: 8:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jingge Wu/
Supervisory Patent Examiner, Art Unit 2624

/JOSE M. TORRES/
12/17/2008
Examiner, Art Unit 2624